

## REMARKS

Applicant has extensively amended the specification and the abstract to overcome the examiners rejections and correct informalities, as suggested, and canceled all claims previously in the application and has substituted new claims therefore an effort to overcome the rejections under 35 U.S.C. § 102 and § 103.

In the official action, the examiner objected to the abstract of the disclosure as follows:

2. The abstract of the disclosure is objected to because the form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. Correction is required. See MPEP § 608.01(b).

Applicant has amended the abstract of disclosure as suggested by the examiner.

Applicant believes that such amendments of obviated the examiner's objection and an action acknowledging same is respectfully requested.

In the official action, the examiner objected to the disclosure because of certain informalities as follows:

3. The disclosure is objected to because of the following informalities: The term--This application is a 35 USC 371 of PCT/CN05/00317, filed on 3/16/05 which claimed the foreign priority of China application Serial No. 200400255977 filed on 3/18/2004 and application Serial No. 200400265343 filed on 4/20/2004.-- should be recited on Pg. 1, line 1, so as to update the status. In addition, the terms "PCB.said" (Pg. 2, line 14), "lens accessory 3" (Pg. 8, line 9), "capsule 12.In" (line 10), "figure 2." (line 14), "Controller 8" (line 20), "controller 8" (line 21), "image sensor 5", "objective lens accessory 5", "lens 7" (line 22), "microwave transceiver 9" (lines 24-25), "figure 3" (Pg. 9, line 1), "ACIS" (line 6), "US" (line 14) and "data 8.And when" (pg. 10, line 16) should be respectively recited as --PCB. The--, --lens accessory 51--, --capsule 12. In--, --figure 4--, --Controller 42--, --controller 42--, --image sensor 6--, --objective lens accessory 51--, --lens 5--, --microwave transceiver 43--, --figure 5--, --ASIC--, --U1-- and --data 8. When--, so as to overcome the typographic errors. Further, the term "outer shell 9" (Pg. 5, line 13) should be deleted, so as to clarify the confusion.

Appropriate correction is required.

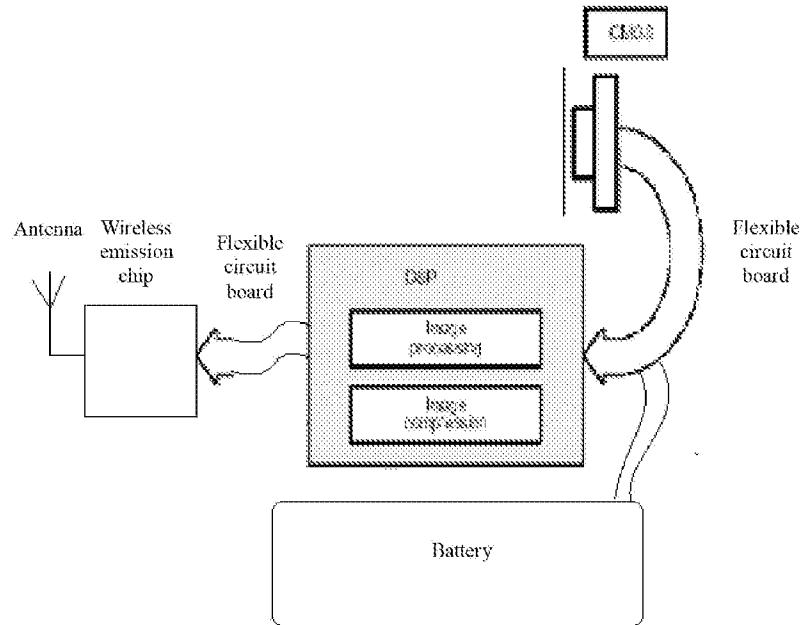
Applicant has extensively amended the specification to correct not only the informalities cited by the examiner but also others that makes the specification/disclosure more readily readable. In view of these amendments, applicant requests that the objection to that disclosure be

withdrawn and an action acknowledging same is respectfully requested.

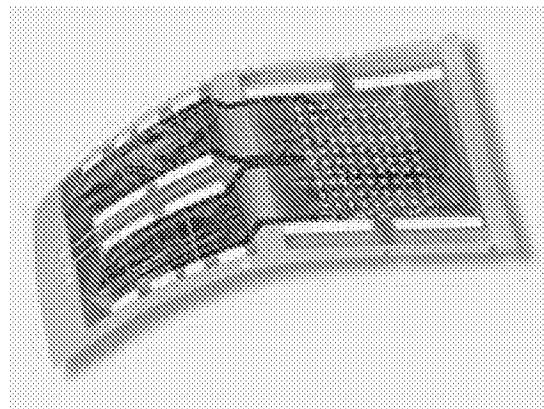
Prior to addressing the substantive rejections, applicant would like to clarify the present disclosure. Specifically, the system of the present disclosure is structured as follows: With the exception of battery, all chips and circuits used in the system of the present disclosure are installed on a flexible circuit board, which is connected to a battery via two wires. In particular, the system of the present disclosure includes: a CMOS camera installed on a flexible circuit board and connected to a DSP chip on the same flexible circuit board via conductors on this flexible circuit board. Image data from the CMOS camera are transmitted to the DSP chip via the conductors on the flexible circuit board. The DSP chip is connected to the wireless data emission chip also installed on the flexible circuit board via connection lines on the same flexible circuit board. Image data compressed by the DSP chip is sent to the wireless data emission chip via connection lines on the flexible circuit board. The wireless data emission chip moderates the data and emits the data via an antenna formed by the conductor printed on the flexible circuit board.

After installation of the CMOS camera, the DSP chip, and the wireless data emission chip on the flexible circuit board, the flexible circuit board is bent and shaped into a cylinder like configuration and connected to a battery via the two wires mentioned above. The system of the present disclosure is completed by wrapping a protective membrane on the exterior of the cylinder like configuration and the battery.

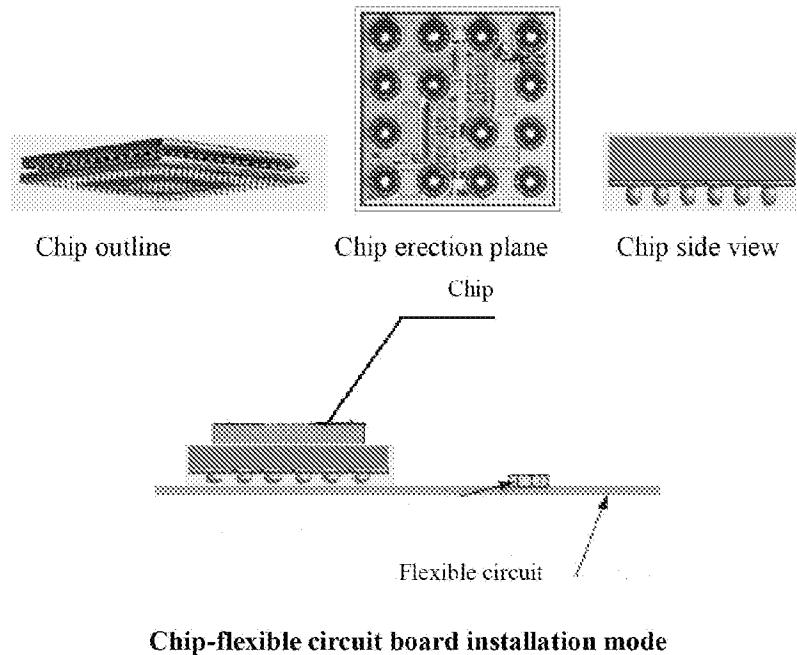
In an effort to more clearly explain this to the examiner, below are schematic diagrams of the system of the present disclosure:



As further illustration of the system of the present disclosure, below is a illustration of the flexible circuit board construction prior to being bent into a cylinder like shape along with illustrations of the chips being assembled to the flexible circuit board in the flexible circuit board installation mode:

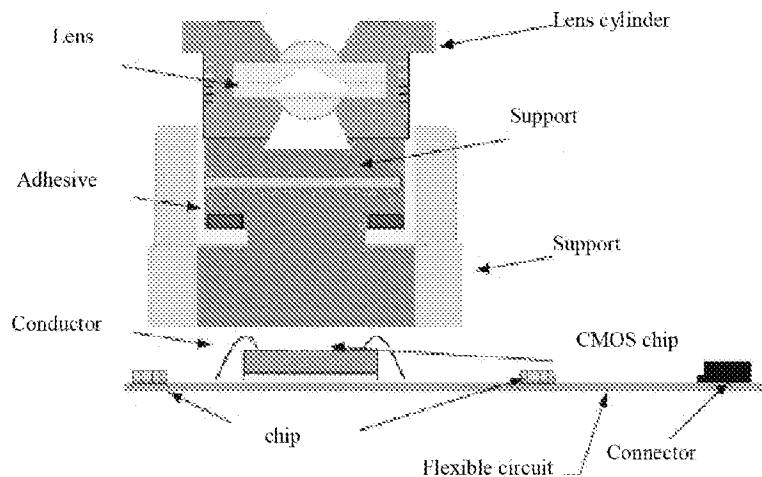


**Flexible circuit board construction mode and outline**



The above details of the chip and the installation mode and the following illustrations are hopefully helpful to the examiner in the understanding of the present disclosure.

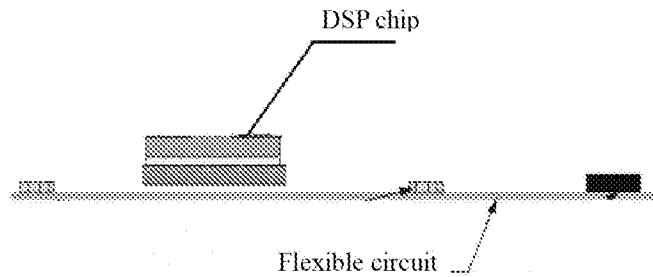
The following is a graphic illustration of the camera installation on the flexible circuit board:



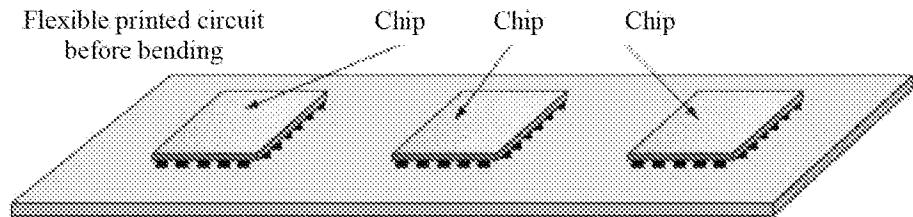
**CMOS camera installation mode on flexible circuit board**

The following illustrations represent the installation of each of the DSP chip in the

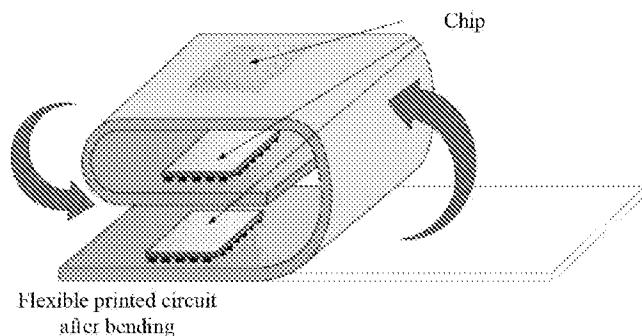
wireless emission chip on the flexible circuit board.



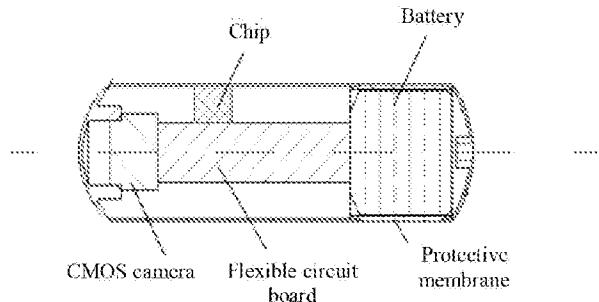
**DSP chip installation mode on flexible circuit board**



**Flexible circuit board after chips and CMOS camera are installed**



**Structure of cylindrical circuit formed by bending of flexible circuit board with chips and CMOS camera installed**



**Complete system of cylindrical circuit structure with battery and protective membrane**

As can be seen from the above schematic representations, the capsule pattern endoscope of the present disclosure represents an advancement in the art in that the endoscope is comprised of uniquely configured components.

We now turn to substantive rejections. In the official action, the examiner rejected all claims under 35U.S.C. § 112, second paragraph, as follows:

Regarding claims 1-4 and 19-34, the recitation therein is unclear and confusing. The structural connections and cooperative relationships among the claimed structural elements, *inter alia*, intelligent capsule, image receiving device, outer shell, image information acquiring device, image signal processing and transmitting device and light source, have not been set forth: In other word, the recitations in these claims are merely directed to an aggregation of parts without setting forth their functions as well as their interconnections and interrelationships as required. In addition, it is unclear as to whether the "outer shell & image information acquiring device" and "signal processing and transmitting device" are directed to a single structural element or they are directed to two individual structural elements. Further, the antecedent basis for "component or component set", "the intelligent device" (as per claim 2), "the rear cover" (as per claim 19), "the unit members" (as per claim 20), "CPU" (as per claim 23), "said image compression processor" (as per claim 28), "the actions" (as per claim 33), and "the carrier capsule" (as per claim 34) is lacking. Furthermore, the references for "component or component set" (as per claim 2) are unclear.

Applicant respectfully submits that the new claims have been drafted such that all claims are now clear and that the structural connections and cooperative relationships among the claimed structural elements have been clearly delineated.

In the official action, the examiner rejected claims 1-3, 19, 21 and 23 under 35 USC 102A as being anticipated by Takizawa et al. (US Pub. No. 2004/0176685 A1) (hereinafter as

Takizawa et al.' 685) as follows:

Regarding claim 1, Figs. 1A-2, 7-11 and 13-23 of Takizawa et al'685 disclose a capsule pattern endoscope comprising intelligent capsule (3) and image receiving device (i.e. extracorporeal unit 5) with the intelligent capsule comprising outer shell (i.e. main body 21) & image information acquiring device (23, 25) installed on the outer shell, image signal processing and transmitting device (i.e. communication circuit 28), light source (26), power source (29) and the image information acquiring device comprising image sensor (i.e. image pick-up element 25) and lens optical system (23), wherein the intelligent capsule has PCB structure on its outer shell (i.e. flexible printed circuit 32).

Regarding claim 2, Takizawa et al'685 discloses that a component or component set inside the intelligent device are directly welded onto the PCB ([0056]).

Regarding claim 3, Figs. 1A-2, 7-11 and 13-23 of Takizawa et al'685 discloses that the image information-acquiring device includes image compression processor (i.e. processing circuit 27) and the image signal-transmitting device includes microwave transceiver (i.e. communication circuit 28) that sends compression image data and controls image data ([0055]).

Regarding claim 19, Figs. 1A-2, 7-11 and 13-23 of Takizawa et al'685 discloses that antenna components (33) are provided on the rear cover of the outer shell.

Regarding claim 21, Takizawa et al'685 discloses that the PCB is soft PCB ([0056]).

Regarding claim 23, Figs. 1A-2, 7-11 and 13-23 of Takizawa et al'685 discloses that the component or component set includes controller (i.e. processing 27), image compression processor (i.e. processing 27), radio transceiving signal processing chip (i.e. communication 28) and antenna component (33) dominated by image sensor (i.e. image pick-up element 25) and CPU (27a).

Applicant respectfully submits that the rejections have been overcome by the new claims and an action acknowledging same is respectfully requested. Specifically, applicant has drafted new claims that have the components clearly interconnected and believes that such is early patentable and an office action confirming same is respectfully requested.

In the official action, the examiner rejected claims 20, 24, 25 and 31-34 under 35 USC 103 (a) as being unpatentable over Takizawa et al. in view of Gazdzinski as follows:

Claims 20, 24, 25 and 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takizawa et al. (US Pub. No. 2004/0176685 A1)(hereinafter as Takizawa et al'685) in view of Gazdzinski (US Pub. No. 2001/0051766 A1).

Regarding claim 20, it is noted that Takizawa et al'685 does not disclose integrated unit members as required. However, Gazdzinski discloses that the unit

members in the outer shell are provided in an integrated manner wholly or partly ([0156], lines 1-19). Hence, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the capsule endoscope of Takizawa et al' 685 with the feature of the unit members in the outer shell are provided in an integrated manner wholly or partly as taught by Gazdzinski as both Takizawa et al'685 and Gazdzinski are directed to the kind of capsule pattern endoscope. The motivation for combining these references is that they are directed to the same field of endeavor (capsule endoscopes) and that integrated circuit members in Gazdzinski addresses the problem of limited space seen in many capsule endoscope applications (Gazdzinski: [0156], lines 1-19).

Regarding claim 24, it is noted that Takizawa et al'685 does not disclose an image cutting device as required. However, Gazdzinski discloses that the image sensor or image compression processor includes image-cutting device ([0210], lines 1-17). Hence, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the capsule endoscope of Takizawa et al' 685 with the feature of the image sensor or image compression processor includes image-cutting device as taught by Gazdzinski as both Takizawa et al'685 and Gazdzinski are directed to the kind of capsule pattern endoscope, so as to provide a smaller image size results in the benefits of reduced data transmission time and reduced space required for memory allocation.

Regarding claims 25 and 32, it is noted that Takizawa et al'685 does not disclose the image compression rate adjusting device as required. However, Gazdzinski discloses that the image compression processor includes image compression rate adjusting device ([0185], lines 16-25). Hence, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the capsule endoscope of Takizawa et al'685 with the feature of the image compression rate adjusting device as taught by Gazdzinski as both Takizawa et al'685 and Gazdzinski are directed to the kind of capsule pattern endoscope. The motivation for combining these references is that they are directed to the same field of endeavor (capsule endoscopes) and Gazdzinski discloses that image compression may be performed using pulse code modulation or delta pulse code modulation. PCM and DPCM require different compression rates, and an image compression rate adjusting device is inherently required to switch between the two compression techniques.

Regarding claim 31, Fig. 2 of Takizawa et al'685 discloses that the image sensor U2 uses CMOS image sensor ([0133], lines 4-8), image compression processor U1 uses CPU, DSP or ASIC processor (27a) and the microwave transceiver JP 1 uses microwave communication chip (28).

Regarding claim 33, Figs. 1B and 2 of Takizawa et al'685 disclose that the image-receiving device is provided with external controller (i.e. PC 6), the intelligent capsule is provided with corresponding controller (i.e. processing 27). The external controller sends microwave control commands to the intelligent capsule so that the controller intelligent capsule completes the actions ([0055]).

Regarding claim 34, it is noted that Takizawa et al'685 does not disclose the carrier capsule as required. However, Gazdzinski discloses that a carrier capsule (i.e. container 1904) is provided inside the intelligent capsule ([0270], lines 1-9). Hence, it

would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the capsule endoscope of Takizawa et al'685 with the feature of the carrier capsule is provided inside the intelligent capsule as taught by Gazdzinski as both Takizawa et al'685 and Gazdzinski are directed to the kind of capsule pattern endoscope, so as to provide complete sampling or medicine feeding.

Applicant respectfully submits that the rejections have been overcome by the new claims and an action acknowledging same is respectfully requested. Specifically, the new claims have been drafted to consider the above applied primary and secondary references. Applicant has clearly delineated the various components of the disclosure in a clear and interconnected manner which applicant submits is not shown in the applied references and an action acknowledging same is respectfully requested.

In the official action, Claims 22, 29 and 30 were rejected under 35 U.S.C. 103(a) as being unpatentable over Takizawa et al. (US Pub. No. 2004/0176685 A1)(hereinafter as Takizawa et al'685) in view of Mizuno (US Pub. No. 2002/0198439 A1) as follows:

Claims 22, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takizawa et al. (US Pub. No. 2004/0176685 A1)(hereinafter as Takizawa et al'685) in view of Mizuno (US Pub. No. 2002/0198439 A1).

Regarding claim 22, it is noted that Takizawa et al'685 does not disclose that the PCB is drum shape and that components are welded to the PCB. However, Figs. 1 and 2 of Mizuno disclose that the PCB (i.e. substrate 3) is in the shape of drum and component or components (i.e. image pickup element 4 and illuminating elements 5) are welded onto the outer surface of the drum-shaped PCB. Hence, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the capsule endoscope of Takizawa et al'685 with the feature of the PCB is in the shape of drum and component or components are welded onto the outer surface of the drum-shaped PCB as taught by Mizuno as both Takizawa et al'685 and Mizuno are directed to the kind of capsule pattern endoscope. The motivation for combining these references is that they are directed to the same field of endeavor (capsule endoscopes) and that drum-shaped substrates are often used because of the cylindrical geometry of capsule endoscopes.

Regarding claims 29 and 30, Takizawa et al'685 discloses that a protective layer is provided for the component or component sets externally, and the main body (21) protect the internal circuitry from external bodily fluids.

Applicant respectfully submits that the rejections have been obviated by the new claims and an action acknowledging same is respectfully requested. Specifically, the new claims have been drafted to consider the above applied primary and secondary references. Applicant has

clearly delineated the various components of the disclosure in a clear an interconnected manner which applicant submits is not shown in the applied references and an action acknowledging same is respectfully requested.

In the official action, Claims 4 and 27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Takizawa et al. (US Pub. No. 2004/0176685 A1)(hereinafter as Takizawa et al'685) in view of Takizawa et al. (US Pub. No. 2003/0020810 A1)(hereinafter as Takizawa et al'810) as follows:

Regarding claims 4 and 27, it is noted that Takizawa et al'685 does not disclose the outer shell bracket as required. However, Fig. 14A and 14B of Takizawa et al'810 disclose that an outer shell bracket (i.e. capsule body 61) that can support the PCB is provided (as per claim 4) and that the PCB is a soft PCB and component or component sets are welded onto the bracket of the outer shell (as per claim 27). Fig. 14A of Takizawa et al' 810 is apparent that the capsule body (61) supports PCB structures such as the LED drive circuit (24) and the communication and control circuit (64); and Fig. 14B of Takizawa et al'810 is apparent that the bracket (i.e. capsule body 61) is separate from the external capsule shell (i.e. transparent cover 62 and back cover 63) as is structurally required. Hence, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the capsule endoscope of Takizawa et al'685 with the feature of the outer shell bracket as taught by Takizawa et al' 810 as both Takizawa et al'685 and Takizawa et al'810 are directed to the kind of capsule pattern endoscope. The motivation for combining these references is that they are directed to the same field of endeavor (capsule endoscopes), have substantially the same structure, and perform substantially the same functions (imaging body structures).

Applicant respectfully submits that the rejections have been obviated by the new claims and an action acknowledging same is respectfully requested. Specifically, the new claims have been drafted to consider the above applied primary and secondary references. Applicant has clearly delineated the various components of the disclosure in a clear an interconnected manner which applicant submits is not shown in the applied references and an action acknowledging same is respectfully requested.

In the official action, Claim 26 was rejected under 35 U.S.C. 103(a) as being unpatentable over Takizawa et al. (US Pub. No. 2004/0176685 A1)(hereinafter as Takizawa et al'685) in view of Takizawa et al. (US Pub. No. 2003/0020810 A1)(hereinafter as Takizawa et al'810) and further in view of Mizuno (US Pub. No. 2002/0198439 A1) as follows:

Regarding claim 26, it is noted that the teachings of Takizawa et al'685 and Takizawa et al'810 do not disclose the outer shell bracket as required. However, Figs. 1 and 2 of Mizuno disclose that the PCB (i.e. substrate 3) is in the shape of drum and component or components (i.e. image pickup element 4 and illuminating elements 5) are welded onto the outer surface of the drum-shaped PCB. Hence, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the capsule endoscope of Takizawa et al'685 and Takizawa et al'810 with the feature of the PCB is in the shape of drum and component or components are welded onto the outer surface of the drum-shaped PCB as taught by Mizuno as both Takizawa et al'685, Takizawa et al'810 and Mizuno are directed to the kind of capsule pattern endoscope. The motivation for combining these references is that they are directed to the same field of endeavor (capsule endoscopes) and that drum-shaped substrates are often used because of the cylindrical geometry of capsule endoscopes.

Applicant respectfully submits that the rejections have been obviated by the new claims and an action acknowledging same is respectfully requested. Specifically, the new claims have been drafted to consider the above applied primary and secondary references. Applicant has clearly delineated the various components of the disclosure in a clear and interconnected manner which applicant submits is not shown in the applied references and an action acknowledging same is respectfully requested.

In the official action, Claim 28 were rejected under 35 U.S.C. 103(a) as being unpatentable over Takizawa et al. (US Pub. No. 2004/0176685 A1)(hereinafter as Takizawa et al'685) in view of Takizawa et al. (US Pub. No. 2003/0020810 A1)(hereinafter as Takizawa et al'810) and further in view of Gazdzinski (US Pub. No. 2001/0051766 A1) as follows:

Regarding claim 28, it is noted that the teachings of Takizawa et al'685 and Takizawa et al'810 do not disclose the image compression rate adjusting device as required. However, Gazdzinski discloses that the image compression processor includes image compression rate adjusting device ([0185], lines 16-25). Hence, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the capsule endoscope of Takizawa et al'685 and Takizawa et al'810 with the feature of the image compression rate adjusting device as taught by Gazdzinski as both Takizawa et al'685, Takizawa et al'810 and Gazdzinski are directed to the kind of capsule pattern endoscope. The motivation for combining these references is that they are directed to the same field of endeavor (capsule endoscopes) and Gazdzinski discloses that image compression may be performed using pulse code modulation or delta pulse code modulation. PCM and DPCM require different compression rates, and an image compression rate adjusting device is inherently required to switch between the two compression techniques.

Applicant respectfully submits that the rejections have been obviated by the new claims and an action acknowledging same is respectfully requested. Specifically, the new claims have been drafted to consider the above applied primary and secondary references. Applicant has clearly delineated the various components of the disclosure in a clear and interconnected manner which applicant submits is not shown in the applied references and an action acknowledging same is respectfully requested.

## **CONCLUSION**

Based on the preceding arguments, Applicant respectfully believes that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicant invites the Examiner to contact Applicant's representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account 19-0513.

Date: February 11, 2010

/Arlen L. Olsen/

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